

IN THE CLAIMS:

1. (Currently Amended) A method for fabricating a semiconductor device, comprising the step of:

depositing a fluorine-containing organic film having a relative dielectric constant of 4 or less on a semiconductor substrate using a material gas, the material gas being selected from gases composed of fluorine and carbon and containing C₄F₆, of which global warming potential is less than 100, as a main component.

2. (Currently Amended) A method for fabricating a semiconductor device, comprising the steps of:

dry-etching an insulating film on a semiconductor substrate using an etching gas, the etching gas being selected from gases composed of fluorine and carbon and containing C₄F₆, of which global warming potential is less than 100, as a main component; and

depositing a fluorine-containing organic film having a relative dielectric constant of 4 or less on the semiconductor substrate using a material gas, the material gas being selected from gases composed of fluorine and carbon and containing C₄F₆, of which global warming potential is less than 100, as a main component,

wherein the step of dry-etching an insulating film and the step of depositing a fluorine-containing organic film are performed in a same plasma processing apparatus.

3. (Original) The method for fabricating a semiconductor device of Claim 2, wherein the step of dry-etching an insulating film and the step of depositing a fluorine-containing organic film are performed in a same reactor chamber of the same plasma processing apparatus.

4. (Original) The method for fabricating a semiconductor device of Claim 2, wherein the step of dry-etching an insulating film includes the step of forming a contact hole through the insulating film,

the step of depositing a fluorine-containing organic film includes the step of filling at least a bottom portion of the contact hole with the fluorine-containing organic film, and

after the step of depositing a fluorine-containing organic film, the method further

comprises the step of:

forming a resist pattern having an opening for wiring groove formation on the insulating film;

forming a wiring groove on the insulating film by dry-etching the insulating film using the resist pattern as a mask;

removing the resist pattern and the fluorine-containing organic film existing in the contact hole; and

filling the contact hole and the wiring groove with a metal film to form a contact and a metal interconnection made of the metal film.

5. (Original) The method for fabricating a semiconductor device of Claim 2, wherein the insulating film is made of a silicon oxide film.

6. (Currently Amended) A method for fabricating a semiconductor device comprising the steps of:

depositing a metal film on a semiconductor substrate;

forming a mask pattern made of a resist film or an insulating film on the metal film;

dry-etching the metal film using the mask pattern to form a plurality of metal interconnections made of the metal film; and

depositing a fluorine-containing organic film having a relative dielectric constant of 4 or less as an interlayer insulating film between the plurality of metal interconnections and on top surfaces of the metal interconnections using a material gas, the material gas being selected from gases composed of fluorine and carbon and containing C₄F₆, of which global warming potential is less than 100, as a main component.

7. (Original) The method for fabricating a semiconductor device of Claim 6, wherein the step of forming a mask pattern includes the steps of:

depositing the insulating film on the metal film;

forming a resist pattern on the insulating film; and

dry-etching the insulating film using the resist pattern to form the mask pattern, and

the step of dry-etching the insulating film and the step of depositing a fluorine-

containing organic film are performed in a same reactor chamber of a same plasma processing apparatus.

8. (Original) The method for fabricating a semiconductor device of Claim 7, wherein the step of dry-etching the metal film is performed in the same reactor chamber.

9. (Original) The method for fabricating a semiconductor device of Claim 8, wherein an inner wall of the reactor chamber includes an aluminum layer and a ceramic layer or an Alumite-treated aluminum layer.

10. (Original) The method for fabricating a semiconductor device of Claim 7, wherein the insulating film is made of a silicon oxide film.